

5. NEVADA TRANSPORTATION ALTERNATIVES

The roads that support transportation to the site characterization facilities at Yucca Mountain could support shipment of wastes to the potential repository site. The modes of transportation of waste would be limited to legal weight truck and limited numbers of heavy-haul shipments. Road upgrade construction costs for limited heavy haul are assumed to be minimal, and the shipment rate is assumed to be limited to six per year.

Rail, full-scale heavy-haul upgrades, or combinations of rail and full-scale heavy-haul upgrades could be constructed to support shipment of most of the waste in casks that are larger and more cost-effective than legal weight truck casks. Rail incurs the largest construction cost, and is the basis for the reference program design. Full-scale heavy-haul construction costs are less than rail, but maintenance and operation costs are greater for heavy haul. The total life cycle costs are approximately the same as for rail.

Five alternative routes for a branch rail line that links an existing Nevada rail-head to the site at Yucca Mountain are currently being considered for the Yucca Mountain Environmental Impact Statement. The most recent construction cost estimates of the routes vary from \$218M to \$740M (98\$), or from \$264M to \$895M (05\$) (CRWMS M&O 1997. *Nevada Transportation Study Construction Cost Estimate*, Predecisional Draft. August 1997. Boise, Idaho: Morrison Knudsen Co). Since no selection of a particular route would be made before the Yucca Mountain Environmental Impact Statement is completed, the current basis for the total system life cycle cost is the average of the preliminary cost estimates for the five routes plus a contingency that reflects the uncertainty in the route that would be used (DOE 1998a, Section 3.2). The construction costs included in the total system life cycle cost, including costs for design, are \$690M (98\$) or \$833M (05\$).

Five full-scale heavy-haul routes that link existing railheads to the site at Yucca Mountain are also being considered as alternatives for the Yucca Mountain Environmental Impact Statement. The construction cost, including costs for an intermodal transfer facility, is assumed to be the cost estimate for the route identified by S. 104 and HR 1270. The construction cost for that route, which is the longest route, is assumed equal to a preliminary estimate: \$153M (98\$) or \$185M (05\$).

Nevada Department of Transportation permits are required for each heavy-haul shipment, including those made on the same day. Difficulties in continually obtaining these permits, however, could significantly limit the rate of waste pickup, and heavy haul on public highways could eventually become untenable at the target rates of receipt. This study, consequently, considers heavy haul only to the extent that either its use is limited to small numbers of shipments or it can be provided in a way that avoids the difficulties associated with extensive use of public highways.

Three alternative levels of construction costs for the Nevada transportation infrastructure were assumed for formulation of implementation scenarios. The levels are referred to as “mostly rail,” “mostly legal weight truck,” and “small transport construction cost” alternatives. The “mostly rail” alternative incurs the largest construction costs from 2005 through 2009. It is assumed to

be identical to the basis for the current CRWMS total system life cycle cost estimate. With this level of construction, transportation of waste would be mostly by rail, with some waste transported by legal weight truck. The lowest level of construction cost was assumed to be minimal. With this level, transportation of waste would be mostly by legal weight truck when waste acceptance begins. Limited amounts of waste would be transported by heavy haul, and rail would not be available until some time after 2010, if at all.

The third level of construction costs for Nevada transportation was chosen in order to analyze the impacts of an intermediate level of construction. The level selected, \$168M (98\$) or \$203M (05\$), is sufficient to provide the construction from 2005 through 2009, of the heavy-haul route identified by S. 104 and HR 1270. The level is also adequate to provide the equipment, not provided in the reference repository design, for transferring large casks from heavy-haul vehicles to rail cars at the repository. It is also similar to the construction cost for the shortest rail route considered for the Yucca Mountain Environmental Impact Statement. With this level of construction, most of the waste would be transported on either a short rail route or a combination of rail and heavy-haul routes that avoids the disadvantages of extensive use of public highways for heavy haul. Some of the waste would be transported by legal weight truck.

The descriptions of scenarios and compilations of analysis results refer to the three alternatives as:

- “Mostly rail”: the alternative with the largest construction cost during 2005 through 2009
- “Mostly legal weight truck”: the alternative with minimal construction costs during 2005 through 2009
- “Small transport construction cost”: the alternative with a short rail route or a combination of rail and heavy-haul routes that avoids the disadvantages of extensive use of public highways for heavy haul. Scenarios that include this alternative are assumed to incur uncertainties in acceptance by the public and regulatory agencies in addition to those associated with the mostly rail alternative.

Projected naval SNF shipment rates (Department of Navy 1996), shown in Table 5-1, were assumed to be supported by rail, and full-scale heavy haul or a combination of rail and heavy haul that avoids the disadvantages of extensive use of public highways for heavy haul.

Table 5-1. Projected Shipment Rates for Naval Spent Nuclear Fuel

Years after Shipping Starts	Canisters of Naval SNF
1	1
2	1
3	3
4	6
5	8
6	9
7	10
8	11
9	12
10	14
11	15
12 – 25	15

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